Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

		•
		A Very later

74.4 7625Uni

LITERATURE ON THE BITTERLICH METHOD OF FOREST CRUISING

O E TEST SPECIALISES CHESIAN NOV 20 1967

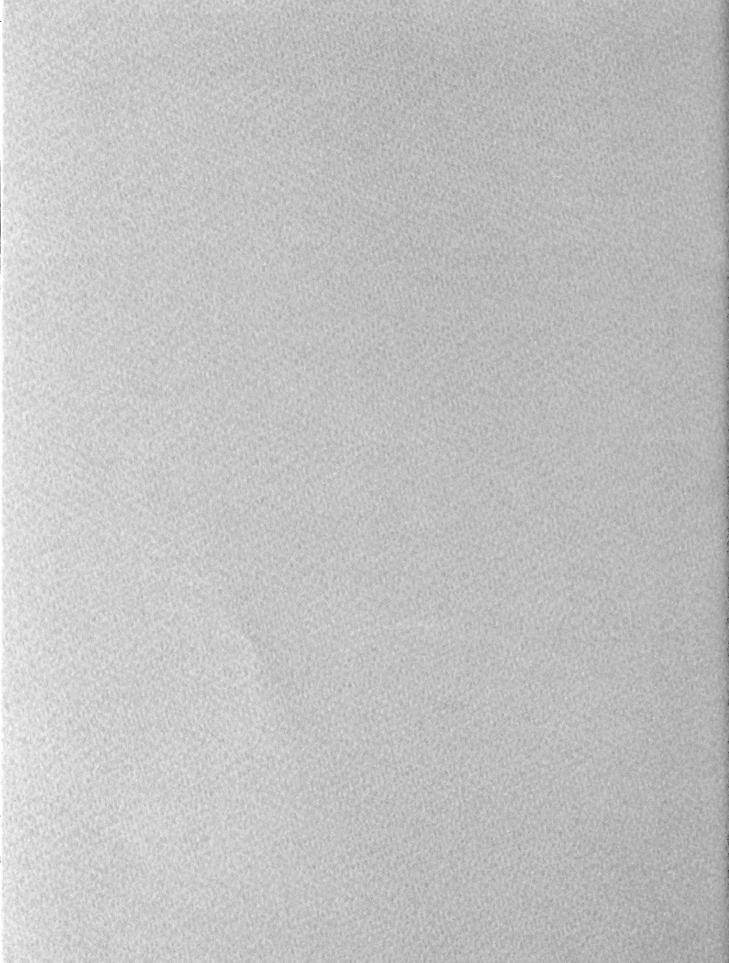
CEREENT CERM PERONDS

A BIBLIOGRAPHY

compiled by VERNON J. LABAU

PACIFIC NORTHWEST

FOREST AND RANGE EXPERIMENT STATION
Institute of Northern Forestry
Juneau, Alaska
U.S. DEPARTMENT OF AGRICULTURE
U.S. FOREST SERVICE RESEARCH PAPER PNW—47
1967



LITERATURE ON THE BITTERLICH METHOD OF FOREST CRUISING

This bibliography on the Bitterlich method of forest cruising (forest point-sampling) begins where an earlier bibliography by George W. Thomson and Glenn H. Deitschman ended. The period covered is generally from 1959 through 1965. This is not an attempt to list all related publications for that period. A few publications are not included here because of the time it takes for some foreign literature to be cited in English sources.

There is a considerable amount of unpublished related material in existence in the form of field plot manuals, in-Service reports, teaching materials, and training aids used by Federal, State, private, and educational sources. Only a limited number of these materials are noted.

The bibliography is compiled in three parts:

- 1. Formal publications
- 2. Unpublished theses
- Unpublished mimeographed reports, papers, and materials.

In addition to the above groups of materials on the Bitterlich method, a number of short selections on forest point-sampling have been published in "Timber Tips for Forest Service Personnel," a serial publication by the Washington Office of the U.S. Forest Service. Forest point-sampling is a modification of the Bitterlich method.

Point-sampling is now being used in the forest inventory program of all U.S. Forest Service Forest Experiment Stations and Regional Offices. Point-sampling instructions have been prepared for local and regional in-Service use by these offices and by the Washington Office of the U.S. Forest Service.

The author is indebted to Mrs. Lora Kelts, Agriculture-Forestry Librarian, and to Jan Van Valzah, Librarian Assistant, both of whom are members of the staff of the University Library at Oregon State University. Their reviews and comments were very helpful and are sincerely appreciated.

Thomson, George W., and Deitschman, Glenn H. Bibliography of world literature on the Bitterlich method of plotless cruising. Iowa State Univ., Agr. and Home Econ. Exp. Sta. 1959.

FORMAL PUBLICATIONS

- 1. Anonymous.
 - 1960. [A calculating drum for use with the relascope.]
 Skogen 47(6): 124. [In Swedish.]
- 2. Adams, Lowell.
 - 1962. The variable-plot tree stem count versus the photocanopy-meter as a measure of overstory. J. Forest. 60: 567.
- 3. Allen, R. H., Jr., and Mogren, E. W.
 - 1960. Range-mean ratio of basal area as an indicator of Bitterlich sampling intensity in lodgepole pine. Colo. State Univ., Coll. Forest. Range Manage. Res. Note 13.
- 4. Alonso, O. G.
 - 1964. [An example of the exactness in measuring trees (*Pinus sylvestris*) when using the Bitterlich relascope.]
 Rev. Forest. Argent. 8(1): 13-14. [In Spanish.]
- 5. Anutschin, N. P.
 - 1960. [Forest mensuration.] 530 pp. Moscow-Leningrad, U.S.S.R.: State Forest Publishing Co. [In Russian.]
- 6. Avery, Gene, and Newton, Roger.
 1965. Plot sizes for timber cruising in Georgia. J. Forest.
 63: 930-932.
- 7. Baraev, S. K.
 - 1963. [Determining stand volumes without measuring the trees.]

 Les. Khoz. 16(8): 26-29. [In Russian.]
- 8. Barrett, James P.
 - 1964. Correction for edged effect bias in point-sampling. Forest Sci. 10: 52-55.
- 9. Bartorelli, U., and Cantiani, M.
 1962. [The stereodendrometer.] Italia Forest. e Mon
 - 1962. [The stereodendrometer.] Italia Forest. e Montana 17(5): 170-182. [In Italian.]
- 10. Bay, B.
 - 1960. Sample plots and the angle count method. New Zeal. J. Forest. 8(2): 231-237.
- 11. Beers, Thomas W., and Miller, Charles I.
 1964. The Purdue point-sampling block. J. Forest. 62: 729-731.
- 12. ____ and Miller, Charles I.

 1964. Point sampling: research results, theory, and applications.

 Purdue Univ., Dep. Forest. and Conserv., Indiana Agr.

 Exp. Sta. Res. Bull. No. 786.

13.	Bitterlich	n, W.
	1959.	[Pressler's volume determination method in a new context.] Allg. Forstzeitung 70(5/6): 47-49. [In German.]
14.		
	1959。	["Tariff-sampling" with tariff fork caliper and relascope.] Allg. Forstzeitung 70(19/20): 225-226. [In German.]
15.		
	1959.	[The technique of the relascope. Efficient forest mensuration work with the mirror relascope.] Centralblatt ges. Forstw. 76(1): 1-35. [In German.]
16.		
100	1959.	[The technique of the relascope. Efficient forest mensuration work with the mirror relascope—(Corrections and additions).] Centralblatt ges. Forstw. 76(2): 116. [In German.]
17.		
17.	1960.	Die Entwicklung der Winkelzählprobe. Arch. f. Forstw. 9(2): 136-148.
18.		
10.	1960.	Vorteile der variablen Probekreistschnik. Allg. Forstzeitung 71(11/12): 121-123.
19.		
,	1961.	[Canopy density determination by the angle-count method.] Holz-Kur. Wien 16(35): 7-8. [In German.]
20.		
	1961.	Relaskopische Probflächen nach Strand。 Allg. Forstzei- tung 72(11/12): 128. [In German.]
21.	-	
	1961.	[Suggestions to forest mensuration.] Allg. Forstzeitung 72(17/18): 209-211. [In German.]
22.		
	1962.	[Relascope with broad scale.] Allg. Forstzeitung 73(5/6): 62-65. [In German. English version by Richard K. Hermann, Forest Res. Lab., Oreg. State Univ., 1963
		trans1. No. 13 in O.S.U. Libr.]
23.	1963.	[Wadala of township]1
	1903.	[Models of terrestrial sampling areas imitating aerial photos.] Allg. Forstzeitung 74(23/24): 256-258. [In German.]

- 24. Bitterlich, W.
 1964. [The thumb as relascope.] Holz-Kur. Wien 19(10): 13-14.
 [In German.]
- 25. Blutel, Y.
 1960. [Quickly, well, completely: does Bitterlich's relascope
 make this possible?] Rev. Forest. Franc. 12(10): 628-636.
 [In French.]

- 28. Bonnett, H. W.
 1959. Guides for variable plot cruising. U.S. Forest Serv.,
 Region 4, Ogden, Utah.
- 29. Bouchon, J.

 1965. [The relascope prisms.] Rev. Forest. Franc. 17(5): 365-373.

 [In French.]
- 30. Bradley, R. T.
 1960. The value of the optical wedge in forestry management.
 Oxford Univ., Engl. Forest Soc. J. (Ser. 5) 8: 6-10.
- 31. Braun, R., and Bitterlich, W.
 1962. Advances in forest survey design and procedure. World
 Forest. Congr. Proc. 5(1): 271-276.
- 32. Bruce, Donald.
 1961. Prism cruising in the western United States and volume tables for use therewith. Portland, Oreg.: Mason, Bruce, and Girard.
- 33. Brunig, E. F. W.
 1964. A preliminary field test of instruments measuring diameters of standing trees. Malayan Forest. 27(4): 361-369.
- 34. Bryan, M. B., and Agaloos, B. C.
 1964. Volume equation-angle gauge combination for easier timber estimates. Lumberman (Manila) 10(3): 49-51.
- 35. Campos Santillan, T.

 1964. [Data processing in the national forest inventory.] Bol.
 divulg. Inst. Nac. Invest. Forest. Mex. No. 10. [In
 Spanish.]

- 36. Carreon, Reyes F.
 - 1963. [Forest inventories. I. Manual of forest mensuration by variable plot cruising.] Michoacan Comm. Forest. B. 12, 64 pp. [In Spanish.]
- 37. Chacko, V. J., Rawat, A. S., and Negi, G. S.
 1964. A point sampling trial with prisms at New Forest, (Dehra
 Dun). Indian Forest. 90(6): 348-359.
- 38. Ch'êng, T. S.
 1960. [A mensuration instrument.] Forest. Sci., Peking (1):
 55-62. [In Chinese. Russian summary.]
- 39. Chinese Academy of Forest Science.
 1959. [Studies on the angle gauge method.] Forest Res. Inst.
 Lin Yeh K'o Ksüeh 5: 403-415. [In Chinese. English summary.]
- 40. Christie, J. M.
 1960. Review of Can. Forest Res. Div., Tech. Note No. 77. "An
 evaluation of the relascope." By R. H. Kendall. Empire Forest. Rev., Vol. 39(4), No. 102, pp. 492-493.
- 42. Cox, P.

 1961. A test of variable plot cruising in mixed stands on
 Latour State Forest. Calif. Dep. Natur. Resources,
 Div. Forest., State Forest Note 5.
- 43. Danielsson, I., and Larsson, U.
 1964. [Personal error in relascope measurements.] Skogen 51
 (3): 90-91 and 95. [In Swedish.]
- 44. Dawkins, H. C.
 1965. Point-sampling by angle-gauge: a simple approach. J.
 Oxford Univ. Forest Soc. (Ser. 5) No. 13, pp. 28-35.
- 45. DeGrace, G.
 1962. Variable plot cruising. Can. Pulp and Pap. Ind. 15(4):
 112, 114, 116, 118.
- 46. De Rosayro, R. A.

 1960. The application of aerial photography to forest management in the tropics (southeast Asia-Pacific Region).

 Fifth World Forest. Congr. Proc. 5(1): 263-271.

- 47. Dilworth, J. R., and Bell, J. F.

 1965. Variable plot cruising. Supplement. In Log scaling and timber cruising, by J. R. Dilworth, 1965 Edition.

 Oreg. State Univ. Book Stores, Corvallis, Oreg.

 (Reviewed in J. Forest. 60: 266.)
- 48. Dixon, R. M.
 1958. Point sampling, wedge prisms, and their application in forest inventories. Can., Ontario Dep. Lands and Forests, Div. Timber, 13 pp.
- 50. Eklund, B.
 1959. [Notes on mensuration instruments.] Svenska SkogsvFören.
 Tidsskrift. 57(3): 393-402. [In Swedish.]
- 51. Elyseu, A. P., and Toulson, L.
 1961. [The relascope and the Bitterlich mirror relascope.]
 Agros (Lisboa) 44(6): 307-346. [In Portuguese.]
- 52. Eriksson, B.
 1964. [The relascope--its accuracy and uses.] Norrlands
 SkogsvardsForbunds. Tidsskrift. (3): 219-259. [In
 Swedish.]
- 53. Evert, Felix.

 1964. Comments on "Faster point sampling." J. Forest. 62: 191.
- 54. Fender, Darwin E., and Brock, Gerald A.

 1963. Point center extension: a technique for measuring current economic growth and yield of merchantable forest stands. J. Forest. 61: 109-114.
- 55. Ffolliott, Peter F.
 1965. Multiple BAF (basal area factors) angle gage. Rocky
 Mountain Forest & Range Exp. Sta. U.S. Forest Serv.
 Res. Note RM-43.
- 56. Ffolliott, P. F., and Barger, R. L.

 1965. A method of evaluating multiproduct potential in standing timber. Rocky Mountain Forest & Range Exp. Sta.
 U.S. Forest Serv. Res. Pap. RM-15.
- 57. and Worley, D. P.

 1965. An inventory system for multiple use evaluations. Rocky
 Mountain Forest and Range Exp. Sta. U.S. Forest Serv.

 Res. Pap. RM-17.

- 58. Food and Agriculture Organization of the United Nations.
 1962. World Forestry Cong. Proc. 5(1): 243, 247, 268, 271-275,
 308, 309, 313, 314. Rome, Italy.
- 59. Gomes, A. M. De A.

 1961. Amostragem por pantos de estacao o relascópio de espelho
 de Bitterlich. [Point-sampling-the Bitterlich mirror
 relascope.] Alcobaca, Secretaria de Estado da Agricultura, Direccao Geral dos Serv. Florestis e Aguicolas.
 36 pp.
- 60. Grossmann, H.
 1960. Die Bedeutung der variablen Probenahme für Holzvorratsinventuren der praktischen Forsteinrichtung Forstl. u.
 Jagdw. 10(12): 542-544.
- 1960. Die Bedeutung der Winkelzählprobe (WZP) und iher Geräte für die Erfassung des Holzvorrates. Forstl. u. Jagdw. 10(1): 13-15. [Summary by Bitterlich--in German.]
- and Wolff, G.

 1963. [Researches on rationalizing methods of growing stock inventory on a statistical basis.] Arch. für Forstw.

 12(1): 77-101. [In German.]
- 63. Haack, Paul M., and Woodrow, Richard E.

 1964. Computer compilation of Forest Service sale cruise data obtained by point sampling in southeastern Alaska.

 15th Alaska Sci. Conf. Proc., College, Alaska, pp.

 138-147.
- 64. Hanna, S.

 1962. Here come the saddle cruisers. Forests and People,
 Alexandria, La. 12(2): 14-16, 42.
- 65. Hellrigl, B.
 1960. [A new theory in dendrometry: the relascope.] Italia
 Forest. e Montana 15(1): 8-28. [In Italian.]
- 1961. [The calculation of form height by the relascope method.]
 Italia Forest. e Montana 16(1): 40-46. [In Italian.]
- 1963. [Calculation of volume with relascopic method.] Italia
 Forest. e Montana 18(3): 93-112. [In Italian.]
- 68. Hide, R. H.
 1964. This thing we call basal area. Quart. J. Forest. 58(1): 32-45.

- 69. Hirata, T.

 1950. [Precisions of variable plot methods.] Tokyo Univ.,
 Fac. Agr. Bull. Tokyo Univ. Forests 54: 1-17. [In
 Japanese.]
- 71. Hodge, J. D.
 1965. Variable plot cruising, a short cut slope correction
 method. J. Forest. 63: 176-180.
- 72. Honer, T. G., and Sayn-Wittgenstein, L.
 1963. Report of the committee on forest mensuration problems.
 J. Forest. 61: 667.
- 73. Houtte, J. Van.

 1964. [The use of Bitterlich's relascope in mensuration.]

 Informativo de Investigaciones Agricolas Suppl. No.

 12(83-118). [In Spanish.]
- 74. Hovind, H. J., and Rieck, C. E.
 1961. Basal area and point sampling: interpretation and application. Wis. State Conserv. Dep. Tech. Bull. 23.
- 75. Hunt, Ellis, V., Jr.
 1961. Need a reliable point sampling board foot factor?--Look
 in your files. J. Forest. 59: 512-513.
- 76. _____, Baker, Robert D., and Biskamp, Lloyd A.

 1964. Point-sampling from two angles. Stephen F. Austin State
 Coll. Dep. Forest. Bull. 6.
- 77. Husch, Bertram.
 1963. Forest mensuration and statistics. Specifically, Chapter
 11. New York: Ronald Press.
- 78.

 1963. [Comparison of estimates of basal area in Pinus radiata plantations, using the Bitterlich method and conventional plots.] Nota tec. Inst. Forest., Santiago,
 No. 1. [In Spanish. English summary.]
- 79. Hyder, D. N., and Sneva, F. A.
 1960. Bitterlich's plotless method for sampling basal ground
 cover of bunchgrasses. J. Range Manage. 13(1): 6-9.

- 80. International Union of Forest Research Organizations.
 1962. Standardization of measurements. Collection and publication of information on instruments used in Forestry.
 Growth and Yield Studies. 13th Cong. Proc., Vienna.
 Part 2, Sects. 25/1, 25/2, and 25/11.
- 81. Irigoyen, E. B.
 1962. [Fundamentals and applications of the relascope.]
 Montes 18(103): 7-13. [In Spanish.]
- 82. Ivanyuta, V. M.
 1960. [Method of plotless cruising.] Les. Zh. Arkhangel'sk
 3(5): 8-10. [In Russian.]
- 1962. [A simple instrument for determining stand volume.]
 Les. Khoz. 15(3): 26-27. [In Russian.]
- 1964. [A universal mensuration instrument and methods of using it.] Les. Zh. Arkhangel'sk 7(6): 47-52. [In Russian.]
- 86. Johnson, Floyd A.

 1961. Standard error of estimated average timber volume per acre under point sampling when trees are measured for volume on a subsample of all points. U.S. Forest Serv. Pacific Northwest Forest & Range Exp. Sta. Res. Note 201.
- 1965. Sample sizes for timber cruises. Pacific Northwest Forest & Range Exp. Sta. U.S. Forest Serv. Res. Note PNW-30.
- 88. Kaushik, R. C.
 1964. Variable plot technique for partial enumerations. Indian
 Forest. 90(5): 270-282.
- 89. Khattak, G. M.
 1965. Comparison of various methods of partial enumeration in
 the high hill forests. Pakistan J. Forest. 15(1): 2528.
- 90. Kim, K. D.
 1963. [On the Bitterlich method.] Seoul Univ., J. Biol. Agr.
 Ser. (B)13: 37-52. [In Korean.]

- 91. Kinashi, K., Nishizawa, M., and Kitagawa, T.
 1962. New development of sampling designs in forest inventories.
 Fukuoka, Japan Kyushu Univ. Bull. 35: 1-84.
- 92. Kirby, C. L.
 1965. Accuracy of point sampling in white spruce-aspen stands
 of Saskatchewan. J. Forest. 63: 924-926.
- 93. Kräuter, G.

 1961. [Some fundamentals for forest inventory in Vietnam and their application in Huu Lung.] Arch. Forstw. 10(9): 982-1030. [In German. English summary.]
- 94. Kuhn, H.
 1962. [A new application of relascopy?] Allg. Forstzeitung
 73(7/8): 77-80. [In German.]
- 95. Kulow, D. L.
 1965. Elementary point sampling. West Virginia Agr. Exp. Sta.
 Circ. 116.
- 96. Kurth, H., and Fischer, O.

 1965. [The accuracy of the mirror relascope for measuring stemwood form-height, tree height, and diameters at different heights.] Arch. Forstw. 14(11/12): 1185-1199. [In German. English summary.]
- 97. Kuusela, K.
 1960. [Alternative methods for calculating the volume of growing stock delineated with relascope.] Metsätaloudellinen Aikak. 2: 41-44 and 51. [In Finnish. English
 summary.]
- 98.

 1961. [The method used in the inventory of the Korppoo (commune) forests.] Metsätaloudellinen Aikak. 8: 285-288 and 307. [In Finnish. English summary.]
- 1961. [Volume and increment calculation of a sample plot determined with the relascope.] Acta Forest. Fenn. 71 (6), 18 pp. [In Finnish.]
- 100. Lambardi, C. H.
 1960. Sencilla explicación del métode Bitterlich. Rev. Forest
 Argent. 4(1): 19-21.
- 101. Lanckton, Arnold H.
 1965. A new variable plot instrument. Photogram. Eng. 31(4): 735-740.

- 102. Lehman, J.

 1965. [Ascertainment of the stem basal area by means of the angle count method of Bitterlich.] Soz. Forstw. 15

 (12): 364-366. [In German.]
- 103. Loetsch, F., and Haller, K. E.

 1964. Forest inventory. (In 2 volumes.) BLV Verlagsgesellschaft, Munchen. 436 pp.
- 104. Løken, J.

 1961. [The eye as a source of error when using a stick relascope.] Norsk Skogbruk 7(5): 174-175. [In Norwegian.]
- 105. Ludvigsen, F. P.
 1959. [Volume determination by relascope and by sample plot;
 a comparison of results by the two methods.] Norsk
 Skogbruk 5(22): 611-612. [In Norwegian.]
- 106. Malain, R. J.
 1961. A test of variable plot cruising in young-growth redwood.
 Calif. Dep. Natur. Resources, Div. Forest., State
 Forest Note 7.
- 107. Marzo, L.

 1962. [Comparative results in determining median diameter and basal area using the tape measure, calipers, and the Bitterlich method in forests planted with eucalyptus.]

 Rev. Forest. Argent. 6(1): 5-15. [In Spanish.]
- 108. Miller, Charles I.
 1963. Faster point sampling. J. Forest. 61: 299-300.
- 109. Morrow, Robert R.
 1962. Comments on "Error in wedge prism calibration." J.
 Forest. 60: 416.
- 1965. Comments on point sampling. J. Forest. 63: 290-291.
- 111. Motovilov, G. P., and Semechkin, I. V.
 1962. [The mirror relascope is a suitable mensuration instrument.] Les. Khoz. 15(6): 19-25. [In Russian.]
- 112. Myers, Clifford A.

 1963. Point-sampling factors for southwestern ponderosa pine.

 Rocky Mountain Forest & Range Exp. Sta. U.S. Forest
 Serv. Res. Pap. RM-3.
- 113. _______ 1964. Volume tables and point-sampling factors for lodgepole

pine in Colorado and Wyoming. Rocky Mountain Forest & Range Exp. Sta. U.S. Forest Serv. Res. Pap. RM-6.

- 114.

 1964. Volume tables and point-sampling factors for ponderosa pine in Black Hills. Rocky Mountain Forest & Range Exp. Sta. U.S. Forest Serv. Res. Pap. RM-8.
- 115. New Zealand Forest Research Institute.
 1960. [Measuring basal area from photographs of angle count 'sweeps'.] Forest Res. Inst. Rep. period April 1,
 1958 to Dec. 1, 1959, pp. 88-89, Wellington, New Zeal.
- 116. Nicholson, D. I.
 1964. Comments on "A new insight to point sampling." J.
 Forest. 62: 757.
- 117. Nyyssön, Aarnee.
 1963. The relascope in the determination of thinning needs.
 J. Forest. 61: 759-760.
- 118. Nyyssönen, A., and Kilkki, P.

 1965. Sampling a stand in forest survey. Repr. Acta Forest.
 Fenn. 79(4) 20 pp. [In English.]
- 119. O'Regan, W. G., and Palley, M. N.
 1965. A computer technique for the study of forest sampling methods. Forest Sci. 11: 99-114.
- 120. Osumi, S.

 1960. [Observations on Bitterlich's "Winkelzählprobe" method.]

 Jap. Forest. Soc. J. 42(6): 211-216. [In Japanese.

 French summary.]
- 121.

 1960. [An application of time analysis to timber cruise.]

 Kyoto Prefect. Univ., Fac. Agr. Sci. Rep. No. 12:

 87-97. [In Japanese. English summary.]
- 1961. [Mathematical statistical interpretation of Bitterlich's "Winkelzahlprobe" method, and the error arising from the heterogenous nature of the stand.] Jap. Forest. Soc. J. 43(4): 111-119. [In Japanese.]
- 123. ______ 1962. Jap. Forest. Soc. 72nd meeting trans., pp. 75-77.
- 1962. [Studies on the errors affecting the determination of the stand basal area in the complete inventory.]

- Kyoto Prefect. Univ., Fac. Agr. Sci. Rep. 14: 75-84. [In Japanese. English summary.]

- 127.

 1964. [Studies on the Bitterlich method.] Kyoto Prefect.
 Univ., Agr. Sci. Fac. Rep. No. 16: 42-87. [In Japanese. English summary.]
- 128. Palley, Marshall N.
 1963. Plot or point sample volumes in even-aged stands using a computer. J. Forest. 61: 28-32.
- 129. Palley, Marshall, and Horwitz, Leah G.
 1961. Properties of some random and systematic point sampling estimators. Forest Sci. 7: 52-65.
- 130. and O'Regan, W. G.

 1961. A computer technique for the study of forest sampling methods. 1. Point sampling compared with line sampling. Forest Sci. 7: 282-294.
- 131. Patrone, G.

 1963. Lezioni di dendrometria. [Textbook of forest mensuration.] 392 pp. Florence, Italy: B. Coppini and Co.
 [In Italian.]
- 132. Petrov, K. H.

 1964. Precision and economic effectiveness in mensuration by using circular test areas and simplified apparatus of Bitterlich. Gorsko Stopanstvo 20(10): 30-32. [In Bulgarian.]
- 133. Pflugbeil, Ernst.

 1964. [The use of different multipliers (subtending angles) in the determination of basal area by the Bitterlich angle count method.] Centralblatt ges. Forstw. 81(1): 24-39. [In German.]
- 134. Popov, I. D.

 1965. Checking the accuracy of determining basal area by the
 Bitterlich relascope and the Anucin prism. Les.
 Khoz. 18(3): 34. [In Russian.]

- 135. Prodan, Michail.
 - 1965. Holzmesslehre. J. D. Sauerlander's verlag, Frankfurt am Main, Ger. 92 D.M. 644 pp. [In German.]
- 136. Redmond, R. A.
 - 1963. Point sampling, strip sampling, and line plot sampling in forest inventory. Scaling, and Forest Manage. Br., Can. Dep. Lands and Mines, Prov. New Brunswick, 26 pp.
- 137. Richter, A., and Grossmann, H.
 - 1959. Untersuchungen über Probekreisgrösse und Netzpunktdichte bei Holzvorratsinventuren. Arch. f. Forstw. 8(11): 976-1016. [In English.]
- 138. Roberts, Edward G.
 - 1961. Still another explanation of the theory behind point sampling. J. Forest. 59: 26.
- 139. _______ 1964. A new insight to point sampling. J. Forest. 62: 267-268.
- 1964. In reply to comments on "A new insight to point sampling."

 J. Forest. 62: 756-757.
- 142. Sanchez Mejorada, N.
 - 1962. Los sitios de dimensiones variables y su aplicacion en Michoacan [Variable plot computing and its application in Michoacan.] Publicación Especial, Comisión Forestal del Estado de Michoacan, Morelia No. 1. [In Spanish.]
- 143. Sayn-Wittgenstein, L.
 1964. Comments on "A new insight to point sampling." J.
 Forest. 62: 756.
- 144. Seely, H. E.
 1964. Canadian forest inventory methods. Can. Dep. Forest.
 Pub. No. 1068. 11 pp.
- 145. Smith, J. H. G., and Breadon, R. E.
 1964. Combined variable equations and volume-basal area ratios
 for total cubic-foot volumes of the commercial trees
 of B.C. Forest. Chron. 40(2): 258-261.
- 146. Spurr, Stephen H.
 1962. A measure of point density. Forest Sci. 8: 85-96.

- 147. Stage, Albert R.

 1960. Computing growth from increment cores with point sampling. J. Forest. 58: 531-533.
- 1962. Tables for point-sampling cruising in ponderosa pine.
 U.S. Forest Serv. Intermountain Forest & Range Exp.
 Sta. Res. Pap. 63.
- 1962. A field test of point-sampling cruising. U.S. Forest Serv. Intermountain Forest & Range Exp. Sta. Res. Pap. 67.
- 150. Stöhr, F. K.

 1959. [A forestry instrument measuring distances and stem numbers.] Allg. Forstzeitschrift. 14(17): 338-340.

 [In German.]
- 151. Strand, Lars.
 1964. Determination of volume by means of the relascope.
 Forest Sci. 10: 51.
- 152. Sudia, Theodore William.

 1960. Frequency calculations from several different forest ecological sampling methods. Ohio J. Sci. 60(2): 100-105.
- 153. Sunakawa, S., and Hirata, E.

 1963. [Double sampling by the Bitterlich method.] Ryukyus
 Univ., Div. Agr. Home Econ. Engl. Sci. Bull. No. 10.

 [In Japanese.]
- 154. Sutter, H.

 1961. Relaskopie. Das Ei des Kolumbus im forstlichen Messwesen. Holz-Kur.; Forst-und holzwirtschaftlicher
 Wochendienst. Vienna, Austria. 16 Jg. Nr. 15.
- 1964. [The accuracy of diameter determination with the mirror relascope.] Allg. Forstzeitung 75(9/10): 91-93. [In German.]
- 1965. Diameter measurement of large trees with the wide-scale relaskop. J. Forest. 63: 101-102.
- 157. Tagudar, E. T., and Arellano, C. A.
 1963. Point sampling; a new and revolutionary method of timber cruising. Lumberman (Manila) 9(6): 20-29.

- 1963. Pi T'e Li Hsi Shih Hsiung Kao Tuan Mien Chi Ts's Ting I Chih Yuan Li Yu Ying Yung [The principle and use of the Spiegel Relaskop.] Taipei, Formosa, Nat. Taiwan Univ., Forest Exp. Sta., Bull. No. 27. [In Chinese.]
- 159. Takata, K.

 1957. [Studies of the volume estimate by basal area at breast height (4) construction of stand volume table.] Jap. Forest. Soc. J. 39(12): 465-470. [In Japanese.]
- 1960. [The photographic estimation of basal area per hectare.]

 Jap. Forest. Soc. J. 42(2): 74-75. [In Japanese.]
- 162. Veruette Fuentes, J., and Pimentel Bribiesca, L.

 1964. [Circular-plot and angle-count sampling compared.] Bol.
 tec. Inst. Nac. Invest. Forest. Mex. No. 17, 24 pp.
 [In Spanish.]
- 163. Vuokila, Y.
 1959. [On the accuracy of the relascope method of cruising.]
 Commun. Inst. For. Fenn. 51(4). [In Finnish.]
- 164. Warren, W. G.
 1960. Measurement of stand basal area with optical wedges.
 Forest Res. Inst. Tech. Pap. No. 33, New Zeal. Forest
 Serv., Wellington, New Zeal.
- 165. Wenk, G.

 1965. [Angle measuring method, a new method of forest inventory.] Soz. Forstw. 5, i.e., 15(8): 251-253, 256.

 [In German. English summary.]
- 1965. [Theoretic principles of the angle-gauge method.] Arch.
 Forstw. 14(11/12): 1235-1253. [In German.]
- 1965. [Experimental experience in applying the angle-gauge method.] Arch. Forstw. 14(11/12): 1255-1270. [In German.]
- 168. _____, Ehrlich, P., and Durdel, A.

 1963. [Results of studies on the exactness of angle counting method.] Soz. Forstw. 13(12): 360-361. [In German.]

- 169. Willingham, J. W.
 1962. Error in wedge prism calibration. J. Forest. 60: 123,
 126-127.
- 170. Young, T. S.
 1963. An improved inventory procedure? J. Forest. 61: 223225.
- 171. Zaichenko, L. P.
 1964. [Summarization of angle method of forest mensuration.]

 In Uchët lesosyr'evykh resursov i ustroistvo les.

 pp. 50-56. [In Russian.]

UNPUBLISHED THESES

- 172. Flores, Marco A.

 1964. Forecasting timber growth by the point center extension modification of the Bitterlich system. Master's thesis on file at Univ. Fla., Gainesville.
- 173. Hale, James A.

 1960. Two cordwood volume tables for angle-count sampling of aspen in lower Michigan. Master's thesis on file at Univ. Mich., Ann Arbor.
- 174. John, Hugo H.

 1964. Comparative precision levels in forest inventory estimating, using sampling with probability proportional to frequency and sampling with probability proportional to size. Ph.D. diss. on file at Univ. Minn.
- 175. Kirby, C. L.
 1961. Point sampling (Bitterlich Method). Master's thesis
 on file at Univ. Mich., Ann Arbor.
- 176. Kulow, Don Lee.

 1963. Comparison of the sampling methods used in forestry.

 Ph.D. diss. on file at Mich. State Univ., East Lansing.
- 177. Lanckton, Arnold H.
 1962. A photogrammetric method of plotless cruising. Master's thesis on file at State Univ. New York, Syracuse.
- 178. Nkopha, A. P.
 1964. [Researches on the degree of accuracy estimating the basal area of the stands by Bitterlich's relascope.]
 Thessalonike, Aristoteleiou, Panepistemion. Forestry diss., 73 pp. [In Greek. English summary.]

- 179. Paine, David Phillip.
 - 1965. Photographic mensurational techniques for obtaining timber management data from aerial photographs on ponderosa pine stands—including the application of the variable plot theory. Ph.D. thesis on file at Univ. Wash., Seattle, 201 pp.
- 180. Shirley, F. C.
 - 1960. A comparison of the amount of time needed to measure fixed and variable radius cruise plots. Master's thesis on file at State Univ. New York, Syracuse.
- 181. Steen, Harold Karl.
 - 1962. A method of stand structure analysis by angle cruising in second-growth Douglas-fir. Master's thesis on file at Univ. Wash., Seattle.
- 182. Sudia, Theodore William.
 - 1954. A comparison of forest ecological sampling techniques with the use of a known population. Ph.D. diss. on file at Ohio State Univ.

UNPUBLISHED MIMEOGRAPHED REPORTS,

PAPERS, AND MATERIALS

- 183. Aird, P. L.
 - 1958. Bitterlich's method of plotless cruising. Rep. to Can. Int. Pap. Co.
- 184. Bajzak, Denes.
 - 1961. A study to test the accuracy and utility of point sampling in central Newfoundland forests using wedge prisms and basal area factors of 5, 10, 20, and 40.

 Can. Dep. Forest., Forest Res. Br., Rep. Proj. NF-55A.
- 1962. A test of relascope sampling under Newfoundland conditions. Can. Dep. Forest., Forest Res. Br., Rep.
 Proj. NF-55A.
- 186. British Columbia Forest Service.
 1957. Consolidated manual, Dep. Lands & Forests, Victoria,
 British Columbia.
- 187. Caron, Leo D.

 1958. Decimal C board-foot basal area ratio tables by Girard form classes for 16-foot logs. Mason, Bruce and Girard (Amer. Bank Bldg., Portland, Oreg.).

- 188. Grosenbaugh, L. R.

 1949. Memorandum to P. R. Wheeler, file designation RS-SS,

 Mensuration, stand studies, variable plot radius.

 U.S. Forest Serv., Southern Forest Exp. Sta., New

 Orleans, La.
- 189.

 1959. Relating stand growth to measurable elements of stand structure. Pap. presented to the New Orleans Forest Manage. Conf. (Dec. 1, 1959), not for publication.
- 190.

 1959. Should continuity dominate forest inventory? Pap.

 presented to the Continuous Inventory Control short
 course. Univ. Georgia, Athens.
- 191. Hays, H. E.

 1962. Variable plot cruising guides for Region 10. U.S.

 Forest Serv., Region 10, Juneau, Alaska. In-Serv.
 rep.
- 192. _____ and Behan, R. W.

 1959. Report on variable plot cruising and its application to Region 10 timber surveys. U.S. Forest Serv., Region 10, Juneau, Alaska. In-Serv. rep.
- 193. Honer, T. G., and Sayn-Wittgenstein, L.

 1962. The relascope, its principles and a test in eastern
 Canada. Can. Dep. Northern Affairs and Natur. Resources, Forest. Br., Forest Res. Div.--S. & M.
 Rep. 58-12.
- 194. Josephson, H. R.

 1961. New developments in forest inventories in the U.S.
 Pacific Sci. Conf. Pap., Honolulu, Hawaii. Aug. 21
 to Sept. 6, 1961. U.S. Forest Serv., Washington, D.C.
- 195. Kirby, C. L.
 1964. An introduction to point sampling. Mimeo. 64-A-15.
 Can. Dep. Forest., Forest Res. Br., Calgary, Alberta.
- 196. Larson, R. W., and Hasel, A. A.
 1958. A field test of forest survey techniques. Mimeo. Pap.
 1-17. U.S. Forest Serv., Southeast Forest Exp. Sta.,
 Asheville, N.C.
- 197. Munro, D. D., Kozak, A., and Hejjas, J.
 1965. Applications of electronic computing to forestry and
 forest research at the University of British Columbia.
 Univ. British Columbia Rep., Vancouver, B.C.

- 198. Palley, Marshal N.

 1960. Estimating the error of sampling in prism cruises.

 Univ. Calif. 12th annu. ext. forest. field school.
- 199. Sayn-Wittgenstein, L.

 1962. An appraisal of the value of permanent point sampling in the maintenance of a forest inventory. Can. Dep. Forest., Forest Res. Br., Ottawa. In-Serv. rep., Proj. S-10.
- 200.

 1963. An attempt to find the best basal area factor for point sampling. Can. Dep. Forest., Forest Res. Br., Ottawa. In-Serv. rep.
- 201. Spada, B.

 1960. A test of several designs for sampling an acre to obtain
 Forest Survey volume and area statistics and area condition classification data. U.S. Forest Serv., Pacific
 Northwest Forest & Range Exp. Sta., Portland, Oreg.
 (Sept. 26, 1960). In-Serv. rep.
- 202. Stage, Albert R.

 1964. Considerations in setting plot size and spacing for cluster sampling to measure basal area stocking. U.S. Forest Serv., Intermountain Forest & Range Exp. Sta., Ogden, Utah. (March 4, 1964). In-Serv. rep.
- 203.

 1964. Calculation of number of sampling points when tree volumes are measured on a subsample of the basal-area sampling points. U.S. Forest Serv., Intermountain Forest & Range Exp. Sta., Ogden, Utah. In-Serv. rep.
- 1964. Sampling procedures for evaluating level-of-growing stock and its dispersion. U.S. Forest Serv., Intermountain Forest & Range Exp. Sta., Ogden, Utah. In-Serv. rep.
- 205. U.S. Forest Service.

 1958. Variable plot cruising with the Spiegel relaskop.

 Ketchikan Ranger Dist., S. Tongass Nat. Forest,

 Ketchikan, Alaska. In-Serv. rep.
- 206. Wheeler, P. R.
 1956. Point sampling on the forest survey. Manuscript from
 U.S. Forest Serv. Eastern Tech. Meeting.
- 207. Wolff, William.
 1955. Descriptive literature on the Spiegel relaskop. 4051
 Maybelle Ave., Oakland, Calif. 94619.

The FOREST SERVICE of the U. S. DEPARTMENT OF AGRICULTURE is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives — as directed by Congress — to provide increasingly greater service to a growing Nation.

